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REMARKS

Applicants thank the Examiner for the consideration given the present application. Claims 1-18 are pending, of which claims 1 and 16 are independent. Reconsideration is requested of the rejections in the Office Action for at least the reasons set forth below.

Claim Rejections under 35 USC §103(a)

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swartz (US 6,871,786) in view of Correa et al. (US 6,340,114B1).

The present invention is a bar code reader which has a first circuit board (12) on which a photodiode (21) is placed. The photodiode (21) receives light reflected from a bar code (2). The bar code reader also has a second circuit board (13) on which a processing unit is placed. The processing unit processes the signal output from the photodiode (21). The position at which the first circuit board (12) is placed can be decided irrespective of the position at which the second circuit board (13) is placed. The first circuit board (12) is placed at a position that is most suitable for receiving light reflected from the bar code (2).

Specifically, the photodiode (21), installed on the circuit board (12), receives light reflected from bar code (2), converts the light into an analog signal, and inputs the analog signal to an amplifier (22). The amplifier (22) amplifies the analog signal and supplies the amplified analog signal an A/D converter (34) installed on the circuit board (12). The A/D converter (34) converts the amplified analog signal to a digital signal. A DSP (33) extracts edge information from this

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digital signal and inputs the edge information to a DSP (32). The DSP (32) reproduces a bar-code pattern from the edge information and inputs the bar-code pattern to a MPU (31). The MPU (31) converts the bar-code pattern to character data and outputs the character data a device such as a POS terminal.

Swartz et al. describes a bar code scanner having a photodetector and a processor. In column 6, lines 45-56 Swartz et al. states,

"In all of the various embodiments, the elements of the scanner may be assembled into a very compact package that allows the scanner to be fabricated as a single printed circuit board or integral module. Such a module can interchangeably be used as the laser scanning element for a variety of different types of data acquisition and printer systems. For example, the module may be alternately used in a hand-held scanner, a table top scanner attached to a flexible arm or mounting extending over the surface of the table or attached to the underside of the table top, or mounted as a subcomponent or subassembly of a more sophisticated data acquisition and printing system."

Correa et al. describes an imaging system that can read various kinds optical codes. The imaging system includes various circuit boards, optical elements and chassis elements. As indicated in column 7, lines 34-38 of Correa et al.

"A packaged image sensor (12) is located on an image sensor board (14). The image sensor board (14) may also contain image acquisition circuitry associated with the image sensor (12). In a preferred embodiment, the image sensor (12) is an area CCD having a window (16) through which an incident image is received."

Further, as indicated in column 16, lines 54-57,

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"As shown in FIG. 17, electronic signals from a CCD detector 400 pass through various signal conditioning blocks to produce a digital output signal 402 applied to a logic board or circuit of the system."

Further, in column 16, lines 63-67 Correa et al. states,

"FIG. 18 is a block diagram of a logic circuit board employed in a preferred embodiment of the present invention. The heart of the logic board is a micro processor 410. Digital signals from the imaging sensor circuits are supplied to the microprocessor by FPGA circuit 411."

Independent claims 1 and 16 have been amended to distinguish them over the prior art. Specifically, these claims have been amended to indicate that two circuit boards each containing photodiodes are used along with a third circuit board containing the processor as shown in Figure 6. Therefore, claims 1 and 16 have been to include the first and second DSP. The prior art of record fails to disclose this feature.

Therefore, withdrawal of the rejection of claims 1-3 under 35 U.S.C. 103(a) as being unpatentable over Swartz (US 6,871,786) in view of Correa et al. (US 6,340,114B1) is respectfully requested.

Claims 4-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swartz (US 6,871,786) as modified by Correa et al. (US 6,340,114B1) as applied to claim 2 above, and further in view of Komizo (US 5,663,552).

Komizo describes a portable information terminal having an image processing function.

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As previously discussed above, claim 16 has been amended to overcome the prior art. Therefore, withdrawal of the rejection of claims 4-18 under 35 U.S.C. 103(a) as being unpatentable over Swartz (US 6,871,786) as modified by Correa et al. (US 6,340,114B1) as applied to claim 2 above, and further in view of Komizo (US 5,663,552) is respectfully requested.

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Conclusion

In view of the aforementioned amendments and accompanying remarks, claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS,
HANSON & BROOKS, LLP



George N. Stevens
Attorney for Applicants
Reg. No. 36,938

GNS/rk
Atty. Docket No. 031303
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



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